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THE BASICS OF WINTER AIR POLLUTION IN UTAH

Revised 03-29-2010

What is winter time pollution?

The air on the majority of winter days is healthy. Each year Utah's valleys experience days when the concentration of Particulate Matter (PM), a mixture of extremely small dust, soot and chemical particles, is elevated.

Utah has exceeded the federal health standards for two classifications of PM:

- PM10-which is 10 micrometers in diameter or less, about 1/7th the diameter of a human hair.
- PM2.5-measures 2.5 micrometers or less.

Winter PM comes from human-related sources. PM is a mixture of extremely small dust and soot as well as particles that form in the atmosphere as secondary pollutants under stagnant winter conditions. Secondary pollutants represent the majority of the PM observed on days that exceed the air quality standards. Soil, dust particles and certain metals are emitted directly into the air as PM by blowing dust from construction sites and agricultural activities, as well as combustion products from solid fuels such as fly ash (from power plants), carbon black (from automobiles and diesel engines) and soot (from fireplaces and wood stoves). Acids, heavy metals and reactive organic compounds can adhere to the PM and be deposited in the lungs. Along the Wasatch Front, the effects of PM can be seen as the thick brownish haze trapped in the valleys during winter months.

Weather also impacts air quality

Combining PM pollution and certain weather patterns can create significant air quality problems. Surface inversions occur when warm air above cooler air acts like a lid, trapping the cooler air at the Earth's surface. They normally weaken and disappear as the sun warms the surface during daylight hours, however, under certain meteorological conditions, such as a strong high pressure over the area, inversions can persist for days. As pollutants from vehicles, fireplaces, and industry are emitted into the air, the inversion traps these pollutants near the ground, leading to poor air quality. Valley topography, low wintertime sun-angle, and snow covered ground also enhance the formation of inversions.

Wasatch Front residents are accustomed to seeing periods of inversion during the winter months. Inversions typically linger until wind or a storm front comes through. The "typical" period is from a few days to a week, although there have occasionally been inversions which have lasted two to three weeks.

How is health impacted during times of high PM or inversions?

Both fine and coarse PM can accumulate in the respiratory system. Coarse PM can aggravate respiratory conditions such as asthma. Exposure to fine PM is associated with several serious health ef-

fects and people with existing heart or lunch disease–such as asthma, chronic obstructive pulmonary disease, and congestive heart failure–are at increased risk of premature death or admission to hospitals or emergency rooms.

When exposed to PM, children and people with existing lung disease may not be able to breathe as deeply or vigorously as they normally would, and they may experience symptoms such as coughing and shortness of breath. PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis, causing more use of medication and more doctor visits. If you have questions please contact your health care provider.

What does DAQ do when pollution levels impact health?

During the winter months, the Utah Department of Environmental Quality operates its "Red Light, Green Light" program to advise residents about wood burning and pollution.

- Under "Green" conditions, wood burning is allowed.
- Under "Yellow" conditions, pollution is building and residents are asked to voluntarily not burn wood and limit driving.
- Under "Red" conditions, pollution levels are unhealthy for sensitive groups and a mandatory no burn period goes into effect. Residents are also asked to reduce driving. The elderly, children or anyone with respiratory problems are advised to reduce prolonged or heavy exertion outdoors.

What actions can people take to reduce pollution levels and reduce their exposure?

The public can help air quality during high pollution times. The following are just a few ideas, for a complete list please visit www.cleanair.utah.gov.

Use a shovel instead of a snow blower, maintain your furnace, replace older wood burning appliances with newer models, burn only clean, seasoned hard wood, limit driving, and conserve energy.

1) Plan strenuous activity when particulate levels are lower;
2) Reducing the amount of time spent in vigorous activity; or
3) Choosing a less strenuous activity (for example, going for a walk instead of a jog).

Particulate levels can also be high indoors. Indoor PM2.5 can be reduced by eliminating tobacco smoke and limiting use of candles, wood-burning stoves, and fireplaces. Certain filters and room air cleaners can help reduce particles indoors. Information on filters and air cleaners is available at: www.arb.ca.gov/research/indoor/particles.htm

Red Air days in 2008

Salt Lake County had 14 yellow and 7 red air days.
Weber County had 15 yellow and 7 red air days.

Air Quality Monitoring Center (AMC)

DAQ's AMC operates and maintains an air monitoring network and provides air pollution information for the daily Air Quality, health advisories, winter season wood burn conditions, and summer season "Ozone Action Day" (Choose Clean Air Day) alerts. There are monitoring centers in the following Wasatch Front Regional Council membership areas: Harrisville, Ogden, Bountiful, Salt Lake City, Murray and Magna.